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A SIMPLE CHEST HARNESS AND POLE LEASH FOR ROUTINE TRANSFER OF RH--ETC(U)
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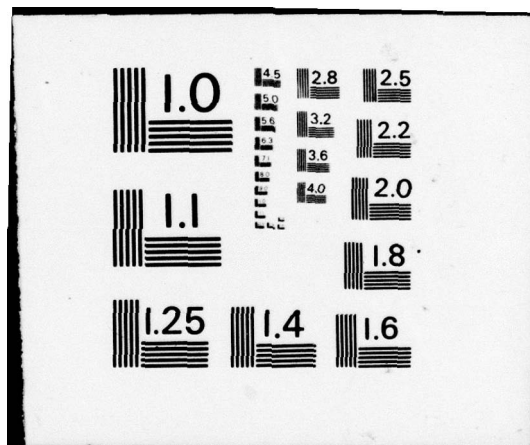
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**A SIMPLE CHEST HARNESS AND POLE
LEASH FOR ROUTINE TRANSFER OF
RHESUS MONKEYS FROM HOME CAGE
TO BEHAVIORAL TEST APPARATUS
AND BACK**

AFRRI TN76-4

J. L. Mattsson
J. P. Alligood
L. F. Robertson III

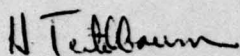
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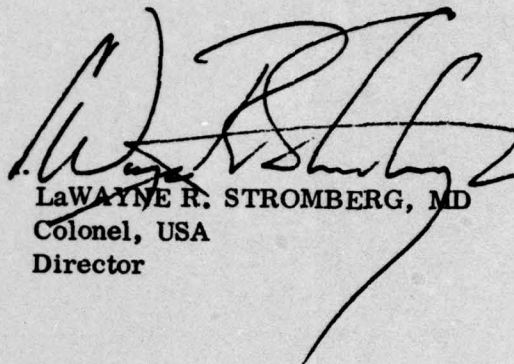
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ARMED FORCES RADIOBIOLOGY RESEARCH INSTITUTE
Defense Nuclear Agency
Bethesda, Maryland 20014

REVIEWED AND APPROVED



H. TEITELBAUM
Acting Chairman
Behavioral Sciences Department



LaWAYNE R. STROMBERG, MD
Colonel, USA
Director

Research was conducted according to the principles enunciated in the
"Guide for Laboratory Animal Facilities and Care," prepared by the
National Academy of Sciences - National Research Council.

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20. ABSTRACT (continued)

posture of the monkey, facilitating teaching the monkey to walk with a leash and to climb into its restraint chair or test apparatus. During transfer the rigid pole prevents escape and protects the handler from attack. Quick release mechanisms on the pole leash allow prompt, complete separation from the animal when it re-enters its home cage. This transfer method has resulted in safer and more efficient training and utilization of monkeys in neurobehavioral research projects designed to evaluate the effects of hazardous chemical and radiation environments on task performance.

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SUMMARY

(Nontechnical)

A guiding principle in biomedical research is that experimental animals be afforded maximal comfort compatible with the nature of the experiment. In primate neurobehavioral research it is a necessary and common practice to restrain monkeys in specially constructed restraint chairs. Although monkeys can be kept in these chairs for many weeks or months in apparently good health, it could hardly be argued that this restraint affords maximal comfort. In addition, the Guide for the Care and Use of Laboratory Animals (DHEW Publication No. (NIH) 73-23, 1972) states that confinement of primates in chairs or other restraint devices is not a normal method of housing, and should not be done simply as a convenience to the investigator. When it is necessary to restrain primates, the period of restraint should be as short as possible.

To minimize the restraint period, a chest harness and pole leash method was developed to transfer rhesus monkeys weighing up to 16 kg from home cage to primate restraint chair. The harness is made of leather straps that cross the chest in an X fashion that creates a V neck. The V neck eliminates the strangulation hazard of neck collars, and minimizes interference between the harness and neck hole of restraint chairs. Two pole leashes attached to two points on the harness give the handler considerable control over the posture of the monkey, facilitating teaching the monkey to walk with a leash and to climb into its restraint chair or test apparatus. During transfer the rigid pole prevents escape and protects the handler from attack. Quick release mechanisms on the pole leash allow prompt, complete separation from the animal when it reenters its home cage.

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INTRODUCTION

A guiding principle in biomedical research is that experimental animals be afforded maximal comfort compatible with the nature of the experiment.² In primate neurobehavioral research it is a necessary and common practice to restrain monkeys in specially constructed restraint chairs. Although monkeys can be kept in these chairs for many weeks or months in apparently good health, it could hardly be argued that this restraint affords maximal comfort. In addition, the Guide for the Care and Use of Laboratory Animals¹ states that confinement of primates in chairs or other restraint devices is not a normal method of housing, and should not be done simply as a convenience to the investigator. When it is necessary to restrain primates to accomplish research objectives, the period of restraint should be as short as possible.

In general, all primate laboratories conducting neurobehavioral research have been confronted with the vexing problem of how to safely capture and restrain their subjects. Early capture methods, such as gloves and nets, were hazardous to both monkeys and handlers. To avoid traumatic capture episodes, the monkeys, once restrained, were kept in restraint chairs for the duration of the experiment.² Techniques now exist which make such permanent restraint unnecessary. Many laboratories currently use a collar and chain permanently attached to the monkey.^{3-5,7} The monkey can then be drawn out of its cage and taken to the experimental apparatus. Anecdotes abound, however, about the small but significant incidence of trauma, and sometimes death, that occurs to monkeys so restrained. Frightened or excited monkeys may attack the chain, or otherwise become entangled in it, with broken limbs, broken teeth, abrasions and lacerations the end result. To avoid having the handler vulnerable to attack, these methods require drawing the monkey directly from its cage into the restraint apparatus,^{3,4} or the use of a rigid pipe or rod in conjunction with the chain leash⁵⁻⁷ to maintain a safe separation distance.

To eliminate the permanently attached chain, one laboratory uses a rod with a snap device on the end.⁶ The handler trains the monkey to come to the front of its cage for a food reward, then snaps the rod onto a ring attached to a permanent leather collar. However, in addition to eliminating the permanently attached leash, it is also

desirable to avoid neck restraint and neck collars in general. Neck collars increase the risk of strangulation, put restraint loads directly on the neck, and interfere with the yoke of primate restraint chairs. To avoid these complications, a chest harness and pole leash capture and restraint method was developed to transfer rhesus monkeys, weighing up to 16 kg, from home cage to primate restraint chair, or other test apparatus.

METHOD

The monkeys are anesthetized with ketamine (15 mg/kg) when harnesses are fitted on the animals. Each harness is made of leather straps that cross the chest in an X fashion that creates a V neck (Figure 1). Holes are punched, and pop rivets placed, as indicated in Figure 1. Equipment and parts list:*

Leather strap	- 3/4" x 1/8" x 60" strips†
Leather punch	- variable or 1/8"
Pop rivet gun	- standard 1/8"
Pop rivets	- 3/8" x 1/8" aluminum
Washers for rivets	- 5/16" diameter, 1/8" center, stainless steel
Metal D rings	- welded at juncture, 1" at base.

To capture a harnessed monkey in its home cage, move the animal to the front of the cage with the standard movable cage back. Then, by use of a pole, grab the harness through any convenient slot between the bars. Bring the harness to the slot and fasten a stout chain dog leash to the harness. Then open the cage door only enough to secure a pole anywhere on the harness. The door can now be opened wide and, by easing tension on the chain, the monkey let part way out of the cage. The harness is now readily accessible and the second pole is applied to a D ring. Since the first pole was attached to any convenient location on the harness, depending on the posture of the monkey at that moment, it can now be repositioned to the other D ring. By letting the chain slide through the slot, the monkey is now clear of the cage. The chain can be removed at any time, depending on the mood and size of the animal. This transfer should be conducted with the realization that once out of the cage the monkey will grab

* Available at leather and hobby shops

† The U. S. customary system of units is used by suppliers

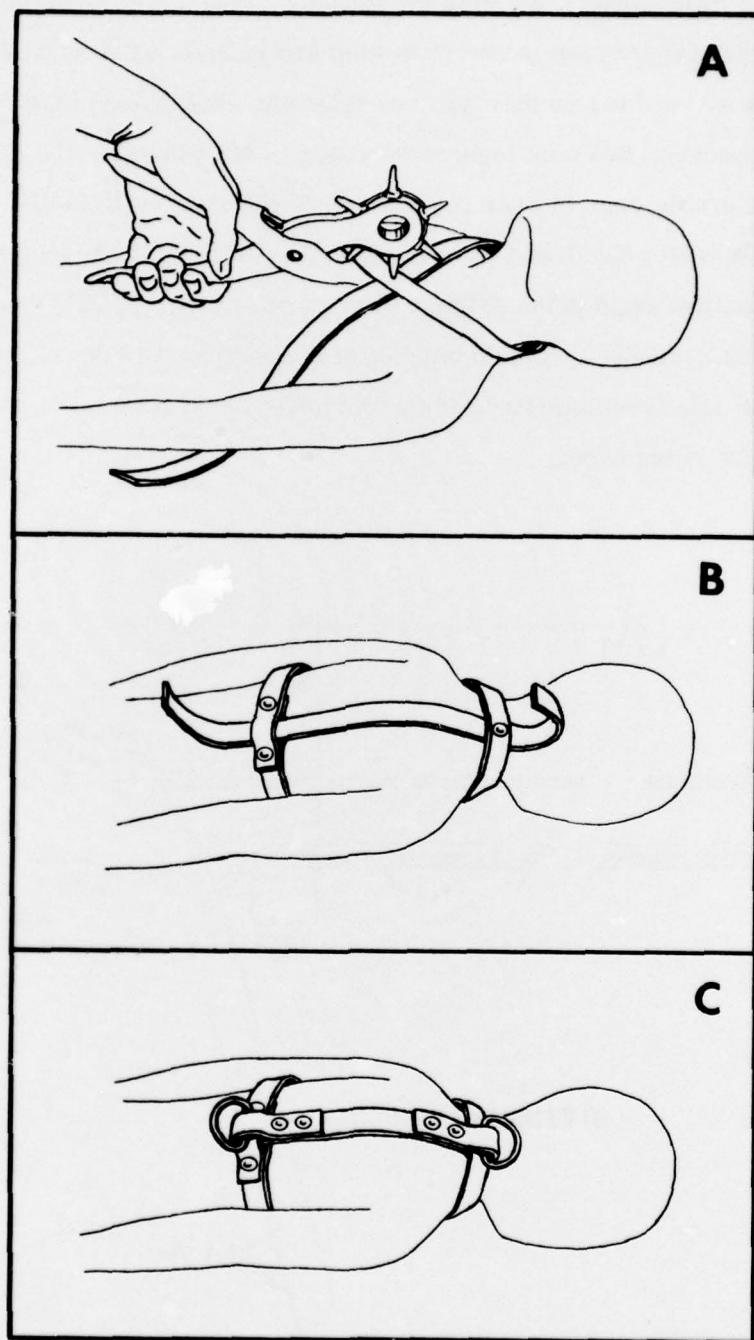


Figure 1. Assembly of monkey chest harness

at cages, pipes, rival monkeys, or other objects. With an aggressive or naive monkey, start walking immediately, keeping the monkey ahead of you with the poles. This usually induces even large naive monkeys to stop struggling and start walking.

The D rings are welded so they will not separate when placed under strain. Two D rings are used because two pole leashes attached to two points on the harness give the handler considerable control over the posture of the monkey to facilitate teaching the monkey to walk with a leash and to climb into its restraint chair or test apparatus. During transfer the two rigid poles (Figure 2) prevent escape, protect the handler from attack, and provide redundancy should one set of connections break. A quick release mechanism on the pole leash allows prompt, complete separation from the animal when it reenters its home cage.

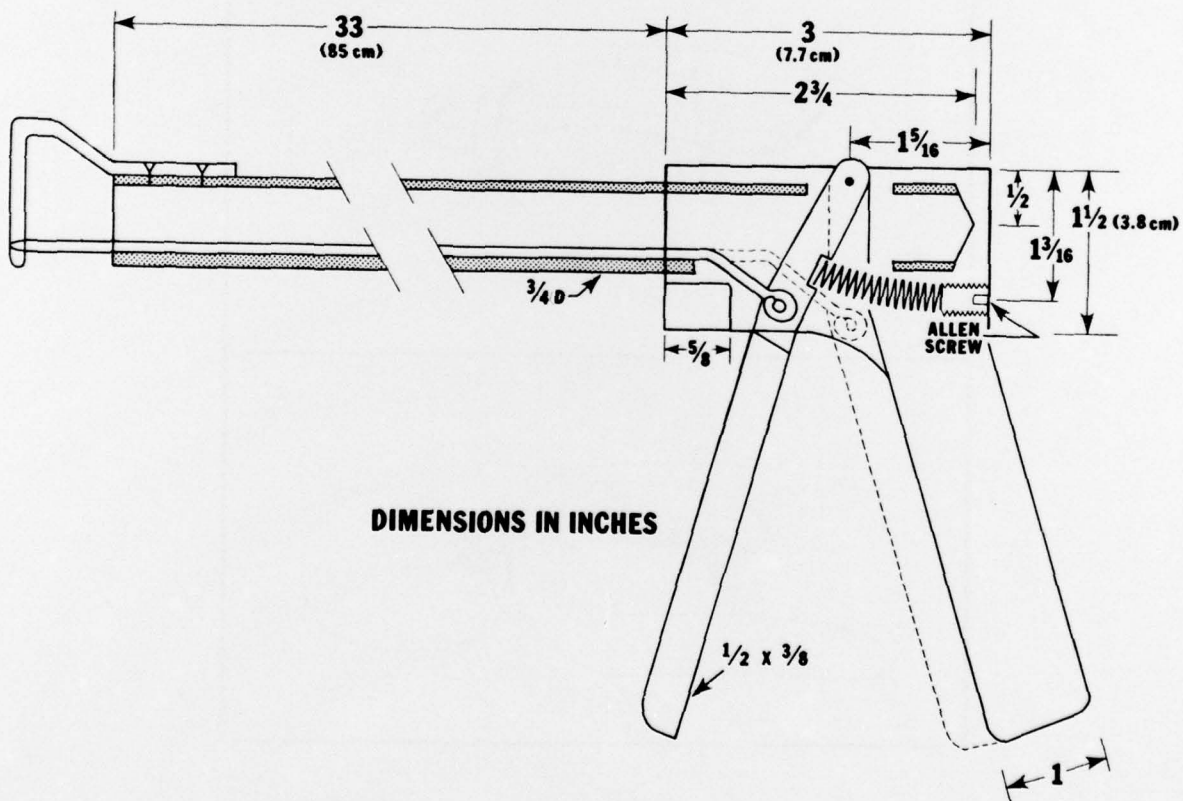


Figure 2. Diagram of monkey lead pole

Although complications have been uncommon, some monkeys weaken the harness by chewing on the V portion. The harness should be checked for fit since the smaller monkeys are rapidly growing, and also since the harness leather stretches with time. However, the monkey growth tends to be compensated for by the harness stretch. Skin rubs and pressure marks have been minimal, but should be watched for.

Pole leash components:*

Handle	- 6" x 3" x 1" linen phenolic (Micarta)
Lead pole	- 6061-T6 drawn round seamless aluminum tube, 3/4" O. D., .065" wall
Trigger lever	- 6061-T6 aluminum, 3/8" x 1/2" x 6"
Latch pin	- stainless steel rod, 1/8" diameter, 36" long
Spring	- .045" diameter wire, 1/8" lead, 5/16" O. D., 1-1/2" length
Hook	- stainless steel type 304, 1/4" diameter, 6" long
Screws	- steel 4-40, 6-32
End plug	- acetal resin (Delrin), 3/4" rod
Spring adjustment screw	- Allen, 3/8-16.

* Materials are available from local metal and plastic supply houses (these suppliers use the U. S. customary system of units)